This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claim 1. (Original) A hollow microsphere comprising a polymeric shell, wherein the thickness of said shell varies less than 10%.

Claim 2. (Original) The microsphere of claim 1, wherein said shell thickness varies less than 5%.

Claim 3. (Original) The microsphere of claim 1, wherein said shell thickness varies less than 1%.

Claim 4. (Original) The microsphere of claim 1, wherein said shell thickness varies less than 0.5%.

Claim 5. (Original) The microsphere of claim 1, wherein said shell thickness is in the range of 100-1000 nm.

Claim 6. (Original) The microsphere of claim 1, wherein said shell thickness is in the range of 150-250 nm.

Claim 7. (Original) The microsphere of claim 1, wherein said shell thickness is in the range of 350-450 nm.

Claim 8. (Original) The microsphere of claim 1, wherein said shell thickness is in the range of 550-650 nm.

Claim 9. (Original) The microsphere of claim 1, wherein said microsphere is substantially devoid of silica.

Claim 10. (Original) The microsphere of claim 1, wherein said microsphere comprises a pore, said pore having a size in the range of 10 -500 nm.

Claim 11. (Original) The microsphere of claim 1, wherein said microsphere comprises an organic dye.

Claim 12. (Original) The microsphere of claim 11, wherein said dye is an Azo dye.

Claim 13. (Original) The microsphere of claim 11, wherein said dye is selected from the group consisting of Indigo Blue, Lissamine Green B, VAT Green 1, VAT Yellow 4, VAT Violet 1, Anthrasol, Blue IBC, Indigosol Pink IR, Indigosol Grey IBL, Anthrasol Brown IBR, and Red 146.

Claim 14. (Original) The microsphere of claim 1, wherein said microsphere comprises a protecting agent.

Claim 15. (Original) The microsphere of claim 1, wherein said microsphere comprises a therapeutic agent.

Claim 16. (Original) The microsphere of claim 15, wherein said therapeutic agent is selected from the group consisting of a polypeptide, an antibody, an enzyme, a nucleic acid, and a small molecule drug.

Claim 17. (Original) The microsphere of claim 1, wherein said shell comprises an acrylate polymer.

Claim 18. (Original) The microsphere of claim 1, wherein said shell comprises a methacrylate polymer.

Claim 19. (Original) The microsphere of claim 1, wherein said shell comprises a styrene polymer.

Claim 20. (Original) The microsphere of claim 1, wherein said shell comprises a polymer of one or more monomers selected from the group consisting of acrylonitrile, styrene, benzyl methacrylate, phenyl methacrylate, ethyl methacrylate, divinyl benzene, 2-Hydroxyethyl methacrylate, cyclohexyl methacrylate, p-methyl styrene, acrylamide, methacrylamide, methacrylonitrile, hydroxypropyl methacrylate, methoy styrene, N-acrylylglycinamide, and N-methacrylylglycinamide.

Claim 21. (Original) The microsphere of claim 1, wherein said shell comprises a co-polymer selected from the group consisting of styrene-PMMA, benzyl methacrylate-PMMA, styrene-PHEMA, styrene-PEMA, styrene-methacrylate, and styrene-butylacrylate.

Claim 22. (Original) The microsphere of claim 1, wherein said polymeric shell comprises a cross-linked polymer.

Claim 23. (Currently Amended) A method for preparing a ~~hollow~~ polymer-coated substrate composite microsphere, comprising:

providing a substrate comprising a plurality of hydroxyl groups;

attaching an initiator agent to said hydroxyl groups to form attached initiator agents;

reacting the attached initiator agents with a polymerizable unit under living polymerization conditions to form a polymer shell over said substrate, said polymerization being confined to a surface of said substrate~~; and~~

~~exposing said substrate to an etching agent for a time sufficient to allow for removal of said substrate from said polymeric shell to form a hollow microsphere~~ to yield a polymer-coated substrate composite microsphere.

Claim 24. (Original) The method of claim 23, wherein said substrate is silica.

Claim 25. (Original) The method of claim 23, wherein said substrate is selected from the group consisting of silica, alumina, mica, and clay.

Claim 26. (Original) The method of claim 23, further comprising exposing said polymer shell to a crosslinking agent.

Claim 27. (Original) The method of claim 23, wherein said polymerizable unit is selected from the group consisting of acrylonitrile, styrene, benzyl methacrylate, phenyl methacrylate, ethyl methacrylate, divinyl benzene, 2-hydroxyethyl methacrylate, cyclohexyl methacrylate, p-methyl styrene, acrylamide, methacrylamide, methacrylonitrile, hydroxypropyl methacrylate, methoy styrene, N-acrylylglycinamide, and N-methacrylylglycinamide.

Claim 28. (Original) The method of claim 23, wherein said polymerizable unit is selected from the group consisting of styrene-PMMA, benzyl methacrylate-PMMA, styrene-PHEMA, styrene-PEMA, styrene-methacrylate, and styrene-butylacrylate.

Claim 29. (Original) A method for preparing a hollow microsphere, comprising:
providing a microsphere substrate; contacting said microsphere substrate with a polymer nanosphere to yield a colloidal assembly; heating said assembly to yield a core-shell composite; and exposing said composite to an etching agent for a time sufficient to allow for removal of said core from said shell to form a hollow microsphere.

Claim 30. (Original) The method of claim 29, wherein said microsphere 1-100 μm in diameter.

Claim 31. (Original) The method of claim 29, wherein said microsphere is 3-10 μm in diameter.

Claim 32. (Original) The method of claim 29, wherein said nanosphere is 1-500 nm in diameter.

Claim 33. (Original) The method of claim 29, wherein said nanosphere is 100-200 nm in diameter.

Claim 34. (Original) The method of claim 29, wherein said nanosphere comprises an amine-modified polymer and said microsphere comprises an aldehyde-modified composition.

Claim 35. (Original) The method of claim 29, wherein said nanosphere comprises an amine-modified polystyrene and said microsphere comprises glutaraldehyde-activated silica.

Claim 36. (Original) The method of claim 29, wherein said nanosphere comprises avidin and said microsphere comprises biotin.

Claim 37. (Original) The method of claim 29, wherein said nanosphere comprises polystyrene.

Claim 38. (Original) The method of claim 29, wherein said polymer nanosphere comprises a mixture of a polystyrene nanosphere and a poly (methylmethacrylate) nanosphere.

Claim 39. (Original) The method of claim 29, wherein said colloidal assembly is heated to a temperature greater than the glass transition temperature of said polymer nanosphere.

Claim 40. (Original) A method for preparing a core-shell composition, comprising: providing a microsphere substrate; contacting said microsphere substrate with a polymer nanosphere to yield a colloidal assembly; and heating said assembly to yield a core-shell composition.

Claim 41. (Original) The method of claim 40, wherein said microsphere 1-100 μm in diameter.

Claim 42. (Original) The method of claim 40, wherein said microsphere is 3-10 μm in diameter.

Claim 43. (Original) The method of claim 40, wherein said nanosphere is 1-500 nm in diameter.

Claim 44. (Original) The method of claim 40, wherein said nanosphere is 100-200 nm in diameter.

Claim 45. (Original) The method of claim 40, wherein said nanosphere comprises an amine-modified polymer and said microsphere comprises an aldehyde-modified composition.

Claim 46. (Original) The method of claim 40, wherein said nanosphere comprises an amine-modified polystyrene and said microsphere comprises glutaraldehyde-activated silica.

Claim 47. (Original) The method of claim 40, wherein said nanosphere comprises avidin and said microsphere comprises biotin.

Claim 48. (Original) The method of claim 40, wherein said nanosphere comprises polystyrene.

Claim 49. (Original) The method of claim 40, wherein said polymer nanosphere comprises a mixture of a polystyrene nanosphere and a poly (methylmethacrylate) nanosphere.

Claim 50. (Original) The method of claim 40, wherein said colloidal assembly is heated to a temperature greater than the glass transition temperature of said polymer nanosphere.

Claim 51. (Original) A core-shell composition, wherein the thickness of said shell varies less than 10%.

Claim 52. (Original) The composition of claim 51, wherein said shell comprises a polymer.

Claim 53. (Original) The composition of claim 51, wherein said core comprises a silica.

Claim 54. (Original) The composition of claim 51, wherein said shell thickness varies less than 5%.

Claim 55. (Original) The composition of claim 51, wherein said shell thickness varies less than 1%.

Claim 56. (Original) The composition of claim 51, wherein said shell thickness varies less than 0.5%.

Claim 57. (Original) The composition of claim 51, wherein said shell thickness is in the range of 100-1000 nm.

Claim 58. (Original) The composition of claim 51, wherein said shell thickness is in the range of 150-250 nm.

Claim 59. (Original) The composition of claim 51, wherein said shell thickness is in the range of 350-450 nm.

Claim 60. (Original) The composition of claim 51, wherein said shell thickness is in the range of 550-650 nm.